Application of metal-organic frameworks with coordinatively unsaturated metal sites in storage and separation of methane and carbon dioxide

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**Figure S1.** Experimental data of adsorption and desorption of CO\(_2\) in Ni\(_2\)(dhtp) (top) and Mg\(_2\)(dhtp) (bottom) at 278, 343, and 473 K, as determined by the volumetric method.

**Figure S2.** Experimental data of adsorption and desorption of CH\(_4\) in Ni\(_2\)(dhtp) (top) and Mg\(_2\)(dhtp) (bottom) at 179, 283, 298, 313, and 343 K, as determined by the volumetric method.

**Figure S3.** CO\(_2\) adsorption in Ni\(_2\)(dhtp) (red) and Mg\(_2\)(dhtp) (blue) at 278, 343, and 473 K. Top: as mass uptake; center: in molar amounts with linear pressure axis; bottom: in molar amounts with logarithmic scale of the pressure axis.

**Figure S4.** CH\(_4\) adsorption in Ni\(_2\)(dhtp) (red) and Mg\(_2\)(dhtp) (blue) at 179, 283, and 343 K. Top: as mass uptake; center: in molar amounts with linear pressure axis; bottom: in molar amounts with logarithmic scale of the pressure axis.

**Figure S5.** Isosteric heat of adsorption of CH\(_4\) in Ni\(_2\)(dhtp) (red) and Mg\(_2\)(dhtp) (blue) as a function of loading, calculated from the isotherms at 179 and 283 K.

**Figure S6.** Adsorption isotherms of N\(_2\) in Ni\(_2\)(dhtp) at 298, 313, 343, 393, and 473 K.

**Figure S7.** Comparison of the amounts adsorbed of CO\(_2\) (blue), CH\(_4\) (green), and N\(_2\) (red) in Ni\(_2\)(dhtp) at a) 298 K, b) 343 K, c) 393 K, and d) 473 K with enlarged ranges where it aids the analysis.
Figure S1. Experimental data of adsorption and desorption of CO\textsubscript{2} in Ni\textsubscript{2}(dhtp) (top) and Mg\textsubscript{2}(dhtp) (bottom) at 278, 343, and 473 K, as determined by the volumetric method.
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